

SECTION H.—ANTHROPOLOGY.

PRESIDENT OF THE SECTION.—Professor WILLIAM RIDGEW.
M.A., LL.D., Litt.D., F.B.A.

THURSDAY, SEPTEMBER 3.

The President delivered the following Address:—

The Application of Zoological Laws to Man.

THIRTY years ago in this very city I heard for the first time a Presidential Address at the British Association, and I was singularly fortunate in entering my novitiate. I had the privilege of hearing Professor Huxley deliver the Presidential Address to the embryo of that Section over which I, a very unsuccessful successor, have this day the honour to preside. On that occasion Huxley almost exclusively with the physical evolution of man, and the Neanderthal played an important part in his discourse. The anthropologists of that time since have severely criticised, and rightly so, the old teleological doctrine that everything except man himself had been created for man's use, and they have actually enunciated the doctrine that man himself has been evolved under the same laws as every other animal. Yet the anthropologists themselves have not always lived out in practice their own principles to their logical conclusions. To-day we attempt to show that the chief errors which impede the scientific study of man, which lead to the maladministration of alien races, and which beget blue the gravest issue in our own social legislation, are due in the main to man in shutting his eyes to the fact that he is controlled by the same laws as the rest of the animal kingdom.

I. Let us first consider some of the chief problems which at present are being debated by the physical anthropologists. Foremost in importance of these is the stratification of populations in Europe. It has generally been held as a matter of faith that Europe was first peopled by a non-Aryan race. Of course it is impossible for us to say what were the physical characteristics of palæolithic man, but when we come to neolithic man the problem becomes less hopeless. It has been generally held that the first neolithic men in Europe, whether they were descended or not from their palæolithic predecessors, had long skulls, and were not Aryan; that later on a migration of short-skulled people from the East passed along Central Europe and into France, becoming what is commonly termed the Alpine, by some the Ligurian, by others the Celtic race; that these two primitive non-Aryan races were overrun by the Aryans, who, when these theories were first started, were universally considered to have originated in the Hindu Kush, but are now generally believed, as held by Latimer Clark, to have originated in Upper Central Europe. Yet, although the view respecting the cradle of the Aryans has changed, anthropologists have not seen the importance of bearing that it has upon the problem of neolithic man. The Aryans are generally held to have had a blonde complexion.

EWAY,

Presidential
entering on
deliver his
unworthy
uxley dealt
arthal skull
at day and
strine that
y emphati-
same laws
ays carried
day I shall
ly of man
lunders of
ian's pride
s the rest

are being
ese is the
an article
urse it is
thic man,
s. It has
her they
kulls, but
om Asia
ommonly
hat later
io, when
ive come
tham, to
cting the
mportant
generally

As our discussion must from its nature concern itself with questions of race, let us first examine the criteria by which anthropologists distinguish one race from another. If you ask an anthropologist how he distinguishes an Aryan from a non-Aryan race, he will tell you that he relies on three main tests: (a) the colour of the skin, hair, and eyes; (b) the shape of the skull and certain other osteological characteristics; and (c) the system of descent through males. Formerly language was included in the tests of race, but when it was pointed out that the Negroes of Jamaica speak English, those of Louisiana French, henceforward it was assumed that one race can embrace the language of another with the greatest ease. Yet it may turn out, after all, that language was too hastily expelled from the criteria of race. On the other hand, we may find that too implicit faith has been placed on the three criteria of cranial characteristics, pigmentation, and law of succession.

(a) As it is assumed that all Aryans were blonde and traced descent through males, so it is held that all Europeans, who are dark-complexioned, and whose forefathers traced descent through women, are non-Aryan in race, and that, although they now in almost every case speak an Aryan tongue, this is not their primitive speech, but simply that learned from their Aryan conquerors. According to this orthodox view, the dark-skinned inhabitants of Italy, Spain, and Greece are all non-Aryan, and all have borrowed the language of their masters, whilst of course the same is held respecting the melanochrous population of France and of the British Isles. Ever since Professor Sergi comprehended under what he terms the 'Eurafrican species' all the dark-complexioned peoples of Southern and Western Europe, as well as the Semitic and Hamitic peoples of Western Asia and Northern Africa, the doctrine that the dark-skinned peoples of Europe once spoke a non-Aryan tongue or tongues is supposed to have been finally established. But under his Eurafrican species Sergi includes the blonde race of Northern Europe who speak Aryan languages along with the dark races who speak non-Aryan tongues. It is argued that as all the dark-skinned peoples on the north side of the Mediterranean belong by their physical type to the same original stock as the Semites and Hamites, they must likewise have spoken non-Aryan languages. Yet it might as well be maintained that the Finns, who speak a non-Aryan tongue, and the Scandinavians, who speak an Aryan, were originally all of one stock, because both races are blonde.

This doctrine of a Mediterranean race depends upon the tacit assumption made by the physical anthropologists that identity or similarity of type means identity of race. Yet this assumption does not bear the test of scientific examination, for it assumes that only those who are sprung from a common stock can be similar in physical structure and coloration, and it leaves altogether out of sight the effects of environment in changing racial types, and that, too, in no long time. The change in the type of the American of New England from that of his English ancestor and his approximation to the hatchet face and thin scraggy beard of the Red Indian have long been remarked, whilst the Boers of South Africa, in less than 150 years, have quite lost the old Dutch build, and become a tall weedy race. The effects of climatic conditions are very patent amongst the native peoples of the New World. The Iroquois of the temperate parts (lat. 40°-45°) of North America were a tall rather light-complexioned race, but as we keep moving south and approach the equator, their kindred tribes grow somewhat darker in complexion and more feeble in physique, except where they live at a considerable altitude, for of course altitude acts in the same way as latitude. When once we pass below the equator the physique keeps steadily improving until we come to the Pampas Indians, a vigorous race who defied all the efforts of the Spaniards to subdue them; and finally we meet the Patagonians (lat. 40°-53°), a fine, tall, light-complexioned race, who form in the south the counterpart of the Iroquois and their closely allied tribes in the north.

The same law, as is well known, can be seen at work in Europe. Starting from the Mediterranean, we meet in the lower parts a melanochrous race; but gradually, as we advance upwards, the population as a whole is growing less dark, until finally, along the shores of the Baltic, we meet the tallest and most

light-complexioned race in the world. Of course it has been explained that the change in pigmentation, as we advance from south to north, is due to the varying proportions in the admixture of the blonde race of the north with the melanochrous of the south. But it is difficult to believe that the movements up or down of the people from the southern side of the Alps, or of those from the shores of the Baltic, have been so nicely proportioned as to give the general steady change from north to south in coloration without the aid of some other force. The case of America, which I have just cited, is in itself enough to raise a suspicion that climatic influences are at work all the time, and that environment is in reality the chief factor in the variation of both stature and pigmentation from the Mediterranean to the Baltic. The white race of the north is of the same proximate ancestry as the dark-complexioned peoples of the northern shores of the Mediterranean. I have already argued elsewhere that, as the ice-sheet receded, mankind kept pressing further north, and gradually under changed climatic conditions the type changed from area to area, and they all still continued to speak the same Indo-European tongue, but with dialectic variations, these also being no doubt due to the physical changes in the vocal organs produced by environment.

If we turn from man to the other animals we find a complete demonstration of this doctrine. For instance, the conditions which have produced a blonde race on the Baltic have probably produced the white hare, white bears, and the tendency in the stoat and the ptarmigan to turn white in winter, whilst in the same regions of Europe and Asia the indigenous horses were of a dun colour, who not only turned white in winter but had a great tendency to turn white altogether. It may be objected that the Lapps and Eskimo are not tall and blonde, but on the contrary short and dark; but they live within the arctic circle in regions where the sun does not shine at all for a great part of the year, and consequently they are quite outside the conditions of environment under which the tall blonde race of North Germany has long dwelt. Of course, in dealing with man we are always confronted with the difficulties arising from his migrations; but if we can find a family of lower animals who cannot be said to have thus migrated, and who show the effects of environment, we shall be able to argue powerfully from analogy.

The horse family supplies the example required. If we follow it from Northern Asia to the Cape of Good Hope, we shall find that every belt has its own particular type, changes in osteology as well as in coloration taking place from region to region. First we meet the old dun horse, with its tendency to become white, the best European examples of which were probably the now extinct ponies of the Lofoden Isles. In Asia, Prejvalsky's horse is the best living instance—a dun-coloured animal with little trace of stripes. Bordering on the Prejvalsky horse or true tarpan come the Asiatic asses: first the *dzegettai* of Mongolia, a fawn-coloured animal, the under-parts being Isabella-coloured; then comes the *kiang* of the Upper Indus valley, seldom found at a lower altitude than 10,000 feet, rufous brown with white under parts, whilst, as might be expected from its mountain habitat, its hind-quarters are much more developed in length and strength than in the asses of the plains. The *Onager indicus*, *onager* and *hemippus* are found in all the great plains of the Punjab, Afghanistan, Western India, Baluchistan, Persia, and Syria, whilst a few are said to survive in South Arabia. All these are lighter in colour than the *kiang*, the typical *onager* being a white animal with yellow blotches on the side, neck, and head. All the Asiatic asses are distinguished by the absence of any shoulder stripe, though they occasionally show traces of stripes on the lower parts of the legs. The southern Asiatic asses just described in their greyer colour and smaller hoofs approximate to the wild asses of Africa, especially to those of Somaliland, whilst it is maintained that in their cry, as well as in their colour, the *kiang* and *dzegettai* come closer to the horse, whose next neighbours they are.

Passing to Africa, we find the ass of Nubia and Abyssinia showing a shoulder stripe, and frequently with very strongly defined narrow stripes on the legs, the ears being longer than those of the *onager*. But in closer proximity to South-Western Asia comes the Somali ass, which differs from those of Nubia and

Abyssinia by being greyer in colour, by the entire absence of shoulder stripes, and by smaller ears, in all which characteristics it comes closer to its neighbours on the Asiatic side than it does to its relations in Abyssinia and Nubia.

Next we meet the zebras. First comes the magnificent Grévy zebra of Somaliland, Shoa, and British East Africa. It is completely striped down to its hoofs, but the coloration of the specimens from Shoa differs from that of those from Somaliland, and from those of British East Africa. The Grévy zebra has its hoofs rounded in front like those of a horse, but its ears are more like its neighbours the asses than those of any other zebra.

In the region north of the river Tana the Burchelline group of zebras overlaps the Grévy, and though it differs essentially in form, habits, and shape of its hoofs from the Grévy some of those in the neighbourhood of Lake Baringo show grid-iron markings on the croup like those on the Grévy zebra, whilst, like the latter, they also possess functional premolars.

All the zebras of the equatorial regions are striped to the hoofs, but when we reach the Transvaal, the Burchelline zebra, known as Chapman's, is divesting itself of stripes on its legs, whilst the ground colour is getting less white and the stripes less black. Further south the true Burchell zebra of the Orange River has completely lost the stripes on its legs and under-surface, its general colouring being pale yellowish brown, the stripes being dark brown or nearly black. South of the Orange River the now extinct quagga of Cape Colony had not only begun to lose the stripes of its under-part and on the hind-quarters, but in Daniell's specimen they only survived on the neck as far as the withers, the animal having its upper surface bay and a tail like that of a horse, whilst all specimens of quagga show a rounded hoof like that of a horse.

In the quagga of 30° to 32° S. we have practically a bay horse corresponding to the bay Libyan horse of lat. 30°-32° N.

But the production of such variations in colour do not require great differences in latitude. On the contrary, from a study of a series of skins of zebras shot for me in British East Africa, each of which is from a known locality and from a known altitude, there can be no doubt that such variations in colour are found from district to district within a comparatively small area.

In addition to the two species of zebra already mentioned, there is the mountain zebra, formerly extremely common in the mountainous parts of Cape Colony and Natal, though now nearly extinct in that area. Its hind legs, as might naturally have been expected from its habitat, are more developed than those of the other zebras, just as these same limbs are also more developed in the kiang of the Himalayas than in any other ass.

With these facts before us, there can be no doubt that environment is a most potent factor not only in coloration, but also in osteology. No less certain is it that environment is capable of producing changes in animal types with great rapidity. Thus, although it is an historical fact that there were no horses in Java in 1346, and it is known that the ponies now there are descended from those brought in by the Arabs, yet within five centuries there has arisen a race of ponies (often striped) some of which are not more than two feet high. Darwin himself has given other examples of the rapid change in structure of horses when transferred from one environment to another, as for instance when Pampas horses are brought up into the Andes.

Another good example is that of the now familiar Basuto ponies. Up to 1846 the Basutos did not possess a single horse, those of them who went down and worked for the Boers of the Orange River usually taking their pay in cattle. At the date mentioned some of them began to take horses instead. These horses were of the ordinary mixed colonial kinds, and we may be sure that the Boers did not let the Basutos have picked specimens. The Basutos turned these horses out on their mountains, where living under perfectly natural conditions their posterity within less than forty years had settled down into a well-defined type of mountain pony.

Nor is it only in the horse family that we meet with examples of the force of environment. The tiger extends from the Indian Ocean, through China up to

Corea, but the tiger of Corea is a very different animal from that of Bengal. Instead of the short hair of the Indian tiger the Corean has clothed himself with a robe of dense long fur to withstand the rigours of the north. It is not unlikely that if we had a sufficient number of skins from known localities we could trace the change in the tiger from latitude to latitude, just as I have shown in the case of the Equidae.

Now whilst there is certainly a general physical type common to all the peoples round the Mediterranean, it by no means follows that all those peoples are from the same original stock. On the contrary, the analogy from man in other parts of the world, as well as that of the Equidae, suggest that the resemblance between the Berbers, who speak Hamitic, the Greeks who speak Aryan, and the Jews and Arabs who spoke Semitic, is simply due to the fact that those peoples from having long dwelt under practically similar conditions in the Mediterranean basin, have gradually acquired that physical similarity which has led Sergi to the assumption that they have a proximate common ancestry, and that they accordingly form but a single race.

Nor is there any lack of instances of convergence of type under similar conditions in the case of the lower animals. We saw that the asses of South-Western Asia approximate in colour to the asses of North-East Africa, and in respect of the size of the ears and absence of shoulder-stripe, more especially to the nearest of these, the ass of Somaliland. Yet it does not follow that they are more closely related to the Somali ass than they are to their own next neighbours, the kiang. On the contrary, it is much more likely that the Somali ass is closely related to those of Abyssinia, and that the South-Western Asiatic asses are closely related to the kiang. The approximation in colour, absence of shoulder-stripe, and size of the ears between the asses of Somaliland and those of South-Western Asia must rather be explained by a convergence of types under the somewhat similar climatic conditions of Somaliland and the nearest parts of South-Western Asia. Again, though there are very strong specific differences between the Grévy and Burchelline zebras met in the neighbourhood of Lake Baringo, there is a curious approximation not only in marking but also in the teeth between these two species, which is best accounted for by supposing that it is the outcome of similar environment. It may be said that this approximation may be due to the interbreeding of the two species of zebras in the region where they overlap. This, in itself a most unlikely contingency from all that is known of the habits of wild species, certainly cannot be alleged in the case of the convergence in type between the asses of South-Western Asia and the Somali ass, since they are separated by the Red Sea and the Persian Gulf.

Again, the representative of the crocodile family in the Ganges is distinguished by the extreme elongation of the head and jaws, whilst the same elongation of the head is equally characteristic of the representative of the dolphin family found in the same waters. Again, all through the Indian Ocean wherever any family of crabs have become inhabitants of coralline sands its members have long legs. Again, it has long been noticed that in Cutch all the larger animals have a tendency to become a sandy colour, whilst in certain areas of South America insects, no matter to what family they belong, have a tendency to one common aspect.

It may of course be said that the changes in colour of the horse family, tigers, and insects are for 'protective' reasons. But the case of the horse family alone is sufficient to dispose of this objection. The kiang of the Himalaya had no dangerous enemy until man was armed with a rifle. In Africa the zebras have had only two formidable foes—man and the lion. It is asserted by the most experienced hunters that the gaudy livery of the zebra makes him conspicuous from afar, whether he is on the mountain, on the plain, or in the shade of a tree. His brilliant colour therefore really exposes him to man. But it will be said that it is well adapted to conceal him at night, at which time the lion seeks his prey. Yet as the best authorities hold that the lion hunts entirely by scent, the coloration of the zebra affords him no protection against his inveterate foe.

I have shown that in horses the

accompany certain well-defined inward qualities. But as black is most certainly not a primitive horse colour, it follows that coat colours may be intimately connected with certain other characteristics quite irrespective of protective colouring. Again, as the variation in the size and shape of the ears and hoofs of the asses and zebras cannot be set down to protective colouring, but must be due to other causes, there is no reason why variations in colour should not be ascribed to similar causes.

The argument based on the analogy of the horse family and the tigers, and on that of the natives of the New World, may be applied to the races of Africa. Next to the Mediterranean lie the Berbers and their Hamitic congeners, who are regarded as part of the Eurafian species by Sergi and his school. But the Berbers are not all of the typical Mediterranean physique. The blonde Berbers of the highlands of Rif in North-West Morocco and of the Atlas have long been well known. In the region lower down and in Western Tunis the occurrence of the xanthochrous type seems much less frequent, whilst further east it practically disappears.

It is certain that there was a fair-haired element in Libya long before Rome conquered Carthage or the Vandals had passed into the ken of history. Callimachus testifies to the existence of blonde Berbers in the third century B.C. We may hold, then, with Sergi and others that the blonde element in the Berbers is not a survival from invasions of Vandals or Goths, or from Roman colonists, but that they rather owe their fair complexions and light-coloured eyes to the circumstance that they were cradled in a cool mountainous region, and not along the low-lying border of the Mediterranean like their dark-coloured relations whose language and customs they share.

If, then, some of those who speak Hamitic are fair, and have been fair for centuries before Christ, as Sergi himself admits, whilst others are dark, there is no reason why some of the peoples who speak Aryan might not be dark whilst others are blonde.

The Berbers and their Hamitic congeners shade off on the south into other peoples, but this is not altogether due to intermarriage, as is commonly held, for it is more probably to be explained as due in a large part to climatic conditions. The Bantus, who are said to have originated in the Galla country and to have spread thence, are now regarded by the chief authorities as the result of an intermixture of Hamites and Negroes. But, on the grounds I have already stated, it is more rational to regard them as having been evolved in the area lying between the Hamitic peoples on the north and the Negroes on the south, just as we have corresponding types of the horse family in Nubia and Abyssinia and in the equatorial regions. The same hypothesis also explains the existence of those cattle-keeping tribes which lie west of the Nile stretching across Northern Nigeria, who border on the Berbers, but yet differ from them, and border also on the Negroes, but differ from them likewise. South of these tribes come the Negroes, the true children of the equator. The Bantu is able to live in elevated equatorial areas, and he has burst his way down to the sub-tropical and temperate parts of south Africa, where he especially flourishes in the highlands, thus showing that his race was originally evolved under similar conditions. The Bantu found in the South the Hottentots, who are especially distinguished by steatopygy, a feature which has led some to identify them with the primitive steatopygous race supposed to have once lived in Southern Europe, Malta, and North Africa, and to have left evidence of their characteristic in their representations of themselves. But, granting that such a race once lived in North Africa and Southern Europe, there is really no more reason for supposing that they and the Hottentots formed one and the same race than there is for assuming that Daniell's quagga, which was practically a bay horse, was proximately akin to the bay horse of North Africa. The occurrence of steatopygy in two areas so wide apart is not due to an ethnical migration, but rather to similar climatic conditions producing similar characteristics. As some anthropologists so commonly explain the origin of races such as the Bantus by intermarriage, it may be well to see whether intermarriage between two races, one of which is an invader, is likely to produce a permanent effect upon

the general physique of a whole community. I have shown elsewhere that the many invasions of fair-haired races into the three southern peninsulas of Europe and into the Aegean islands have left no permanent trace on the population. It is a matter of common knowledge that the offspring of British and native parents in India have a constant tendency to die out. The same undoubtedly holds true for the offspring of British soldiers serving in Egypt, the Soudan, and West Africa. The native race always reasserts itself. In America the Spanish blood has died out, or is dying out, everywhere except in the temperate regions of Chile, Quito, and Argentina, where the descendants of the Spanish settlers thrive in a climate very analogous to that of Spain. In the Southern States of North America the whites cannot flourish, and only just manage to survive. On the other hand the descendants of the Negro slaves imported into Brazil, the West Indies, and the Southern States of North America thrive and multiply with extraordinary vigour; a fact doubtless due to their race having been evolved under similar conditions in equatorial Africa.

Even from the evidence already to hand there is high probability that inter-marriage can do little to form a new race unless the parents on both sides are of races evolved in similar environments.

I have already pointed out that although the fair-haired race of Upper Europe has age after age kept pouring over the Alps into Italy and the other southern peninsulas, and have constantly intermixed with the indigenous populations, it is only in the upper part of Italy that the blonde race is able to hold its own. In Italy the xanthochrous race in ancient times as to-day had its maximum along the Alps, and gradually dwindled towards the south until the melanochrous race stood practically alone in the lower part of the peninsula. So too in the Balkan, whilst the fair-haired element was at its maximum along the Alps and the Danube, southwards the melanochrous becomes more and more completely dominant, as it practically is to-day in the lower part of the peninsula.

(b) In the Alpine regions there has been from Neolithic times a brachycephalic race, also found in Central France and in the British Isles, whither it is supposed to have come in the Bronze age. It has been a fundamental article of faith with Sergi and others that this round-headed race came from Asia, the home of brachycephalism. It is Mongolian according to most, and spoke a non-Aryan language; but Sergi regards it as Aryan, thus reverting to the old doctrine, which made the Aryans come from Central Asia, and he assumes that these invaders imposed their language both on the aborigines of Italy, such as the Ligurians, and on the blonde race of Northern Europe; but we shall soon see that this assumption has no base. Now, as these folk dwelt in the region where we find the Ligurians of historical times, others have argued that the Ligurians were a non-Aryan people from Asia. But it is impossible to find any hard-and-fast lines between the Alpine race and the peoples north and south of it in culture and sociology. For that reason when treating of the people of the Alps in my 'Early Age of Greece' I did not take any account of the difference in cranial measurements. In 1906, at the British Association, I maintained that this difference of skull type did not mean any racial difference, and on the analogy of the changes in the osteology of the Equidae I urged that the roundness of the skulls was simply due to environment, as the horses of the Pampas when brought up into the mountainous regions of Chile and Peru rapidly change their physical type. Physical anthropologists have already maintained that the round head of the Mongolian has been developed in the high altitude of the Altai. If that be so, there is no reason why a similar phenomenon should not have taken place in the Alpine region, in Albania, Anatolia, and wherever else in mountain areas brachycephaly has been found in more than sporadic examples, which of course may well be due to migrations or importation of slaves. But I am far from suggesting that altitude is the only cause of brachycephaly.

The evidence then, as far as it goes, points to the same conclusion as that to which we came as regards pigmentation, and it may eventually be proved that just as each area has its own type of coloration, so also has it its own osteological character. In support of this I may point out that recently Dr. William Wright,

Hunterian lecturer, has come to the conclusion from his craniological investigations that the brachycephalic Alpine race was evolved on European soil, whilst Dr. C. S. Myers has been led by his researches on Egyptian skulls to conclude that, 'in spite of the various infiltrations of foreign blood in the past, modern Egypt contains a homogeneous population which gradually shifts its average character as we proceed southwards from the shores of the Mediterranean to Nubia beyond the First Cataract.'

It is not impossible that Alpine environment may have acted upon the shape of the skull of the ox as well as that of man. We know from the examination of the fauna of the Lake dwellings of Switzerland that the Celtic ox (*Bos longifrons*) was there the common type, and its descendants still continue to be the typical breed along the Alpine chain. This ox is characterised by its strongly developed occipital region and its small horns curved forward and inward. As it differs so essentially from the urus (*Bos primigenius*) and from the long-horned cattle of the Mediterranean lands, it seems not unlikely that the peculiar cranial formation may have been evolved under mountainous environment.

It is now clear that differences in the shape of the skull and in the colour of the skin, hair, and eyes cannot be at all implicitly relied on as criteria of race. The defenders of the non-Aryan character of the dark races of Greece, Italy, Spain, France, and the British Isles have now to depend on two arguments only, one of which is linguistic, the other sociological. It is admitted that it is very difficult to point to any non-Aryan survivals in the vocabularies of the languages of these countries, and it is also admitted that in them all the tense system of the Aryans has been taken over in its entirety. Neither Kretschmer nor anyone else has ventured to affirm that there is any survival of non-Aryan syntactical forms in Greek, the language of all others in which the Aryan tense system is found in its greatest delicacy and perfection. But we know that in all cases where an Aryan language has without doubt been adopted by a non-Aryan folk the tense system is invariably broken up. No better example than this is needed than ordinary 'pigeon' English. So difficult is it for the defenders of the non-Aryan theory of the origin of the aborigines of Greece to maintain their position that one of the latest, Professor Burrows, has to rely on certain supposed syntactical survivals of a non-Aryan language which Sir John Rhys believes that he has found in Welsh and Irish and in the remarkable resemblance which Professor Morris Jones thinks that he has traced between the syntax of those languages and that of Berber and ancient Egyptian.

Yet when we examine the evidence on which Sir John Rhys relies, it turns out to be only three Welsh and Cornish oghams, written not in pure Celtic, but in dog Latin, and also two Irish oghams, which show a looseness in the use of the genitive suffix at a time when final syllables were dropping out of use in Irish. Sir John Rhys supposes that the non-Aryan inhabitants of these islands derived their Gaelic speech from a people whom he terms Celticans, who spoke Goidelic, and who were followed by the Brythons, who found the aborigines already Celticised. Professor Morris Jones freely admits that the aborigines must have borrowed the full Aryan tense system, a fact in itself sufficient, from what I have already said, to arouse grave suspicions as to the validity of any arguments based on supposed fundamental grammatical differences. But this supposed taking over of the full Aryan tense system by the non-Aryan aborigines of these islands is rendered all the more miraculous from the circumstance that Sir John Rhys holds that his Celticans who spoke Goidelic 'came over not later than the great movements which took place in the Celtic world of the Continent in the sixth and fifth centuries before our era,' that the Brythons came over to Britain between the time of Pytheas and that of Julius Cæsar, and that the Brythons were not likely to come into contact on any large scale with the aborigines 'before they had been to a considerable extent Celticised.' It is thus assumed that it was possible for the aborigines to have been so completely Celticised as to have adopted the Aryan tense system, as well as the Aryan vocabulary, in its fulness in the interval between the sixth or fifth century and the second century B.C. Yet English has been the master speech in Britain for many centuries, and that, too, when reading

and writing have been commonly practised ; yet Gaelic still survives, whilst Welsh not only survives but flourishes. It is therefore simply incredible that such a complete transformation as that postulated could have taken place in three or four centuries in an age when writing and literature can be hardly said to have existed in these islands.

Let us now see under what conditions does one race or people borrow the language of another. Slaves of course take over the language of their masters, but we have to consider (1) the adoption by a conquering people of the language of the conquered, (2) the adoption by a conquered people of that of their conquerors, and (3) the adoption by a people themselves unconquered of the language of their neighbours. Under what conditions do the conquerors adopt the language of the conquered ? Ireland affords us at least two certain examples. Cromwell planted large bodies of his English soldiers in Tipperary, but they had no English women, and therefore took as wives the daughters of the land, who spoke the Irish language. From this union resulted a splendid offspring, who spoke chiefly the language of their Irish mothers, and not their fathers' English. So it came to pass that in a single generation the progeny of Cromwell's Puritans were in language as Irish as the purest blooded aboriginal of Munster. Yet this adoption of the Irish language by the great majority of the children of these settlers took place in spite of the effect which the reading of books in English must have exerted to counteract the tendency to adopt the Irish language. Let us go back five hundred years in Irish history and we find exactly the same process going on. The Normans who followed Strongbow into Ireland, like their captain, frequently married native women. It is a matter of common knowledge that the Anglo-Norman settlers in a short time became *Hiberniores ipsis Hibernis*.

These and other examples too numerous to cite here prove that the children of bodies of conquerors who marry the women of the land will have an inevitable tendency to follow their mothers' speech. We may also lay down as a solid factor in the tendency of the conqueror to merge into the conquered the isolation of the conquerors from their original homes and from the great mass of those who speak the same language.

Next we come to the case where the conquerors bring with them some women of their own race. This of course helps to keep their own language alive, as a certain number of the children speak it as their mothers' tongue. But even in these circumstances the invaders are liable to drop their own language and practically adopt that of the natives. Thus the Northmen who settled on the coast of France gradually abandoned their national tongue for French, though modifying dialectically their adopted language. When under the name of Normans they conquered and settled in England, they again adopted the language of the conquered, though modifying the English tongue by many words and phrases brought with them from Normandy, and we have just seen how some of their descendants who settled in Ireland for the third time changed their speech for that of the conquered.

Hitherto all our examples show the adoption by the conquerors of the language of the conquered, even when they bring a certain number of their women with them.

We now come to undoubted cases where the language of the conqueror has been able to get a firm foothold. From the time of the plantation of Ulster, the advance of the English tongue, and consequent decadence of the Irish, has steadily proceeded, for the settlers, unlike Cromwell's Ironsides, brought with them women of their own race and speech. Consequently their children grew up speaking English as their mothers' tongue. Yet even with such a basis the advance of English amongst the Irish has been exceedingly slow. In the glens of Antrim the Irish language still lingers on, whilst in Donegal, Connaught, Kerry, Cork, and Waterford, English has not succeeded in ousting completely the native language, though the former is the language of the national schools, of the newspapers, and of trade.

The story of the establishment of English itself in Britain is just the same as in Ulster. We know from Bede that the Angles who settled in Britain left

Holstein in large bodies, bringing with them their wives and families, and leaving their old homes without inhabitant. Having thus settled in solid masses in the east of Britain, they retained fully their own tongue, impressed it upon their menials, and gradually, as they extended their conquests westward over the island, English became the language of the land. Yet in Wales the ancient speech still flourishes.

We may therefore conclude that the adoption by the conquered of the language of the conqueror, even when it does take place, which is but rarely, is a very slow and tedious process, although every advantage is on the side of the invading tongue, and that when the native speech gets a fair field, as in Wales, the language of the conqueror can make little or no advance.

Only the third possibility now is left—that one people can adopt without conquest the language of another. But no example of such can anywhere be found, although Europe presents numerous instances to the contrary. There can be no stronger case than that of the Swiss Republic, in which peoples with more than four kinds of language combine for national defence and other advantages. Here, if anywhere, we ought to find a gradual adoption by certain cantons of the language of their neighbours. But, far from this being so, the German, French, Roumansch, and Italian cantons rigidly preserve their respective mother-speeches. In the Austro-Hungarian Empire there is no tendency observable on the part of either Magyars or Slavs to adopt German; nay, the very opposite is the case. Again, the Finns have not adopted either Swedish or Russian, though partitioned between their more powerful neighbours.

To sum up, it seems that no nation readily adopts the language of another, even though it be in close ties of friendship; whilst there is still less tendency when national hostility intervenes. Secondly, the adoption of the language of the conqueror by the conquered, except under the most favourable circumstances, is not common, and only takes place by a very gradual process, as is seen in the case of Ireland. Thirdly, there is a strong tendency for the conqueror to adopt the language of the conquered, as was done by the Normans in England, in Ireland, in Sicily, and in Italy; by the Cromwellian settlers in Tipperary, by the Bulgari in Bulgaria, by the Franks in Gaul, by the Lombards in Italy, and by the Visigoths in Spain. There is thus an inevitable tendency for the children to speak their mothers' tongue, and indeed the phrase 'mother-tongue' is based on the fact observed through long ages that the child learns its first words from its mother and thus takes after her in speech. This law, which still holds good in modern days and in civilised communities, must have been far stronger in earlier times in countries where the tie of marriage hardly existed and the child belonged to its mother's and not to its father's tribe, as is still the case in many parts of the world.

In view of these facts we cannot accept Sir John Rhys's hypothesis that when a few bodies of invaders, whom he terms Celticans, passed into Ireland the indigenous supposed non-Aryan race within two centuries completely abandoned its own language, taking over in its entirety the Aryan tense system as well as the Aryan vocabulary of its conquerors.

Now let us turn to Greece, Italy, and Spain. It is admitted that neither Arcadia nor Attica was ever conquered by Achæans or Dorians, yet in both these areas the Greek language existed through all historical time, and in Attica especially the Aryan tense system is found in its highest perfection. The dialect of Arcadia cannot have been taken over from Achæans or Dorians, because it is the same as that of the Cypriotes from Arcadia who settled in Cyprus at least 1100 B.C. It is also very close to the dialect of Pelasgiotis in Thessaly, the home of the aboriginal Pelasgian population, whilst it comes closest of all Greek dialects to that of the ancient Epic. There can therefore be no doubt that Arcadian is no mere bastard lingo, half non-Aryan, half Aryan, but is the genuine speech of the oldest and most unmixed population of Greece, who were undoubtedly a melanochrous race, and who also most certainly had occupied Greece from the Stone age.

The Ligurians, who formed from the Stone age the bottom stratum in all

Upper and Central Italy, are now admitted to have spoken an Aryan language, and I have recently given some reasons for believing that the Latin language is simply the native tongue of the aboriginal Ligurian population of Latium with some admixtures derived from the Italic tribes of Siculi and Sabines. I have also shown that the ancient Iberians, the next neighbours of the Ligurians, used the same forms of place-names as the latter, and that some of the words plainly exhibit Aryan terminations. Thus we may conclude that with the exception of the Basques, who are probably a non-Aryan spurt from North Africa, the melanochrous populations of Spain, Italy, the Balkan Peninsula, France, Britain, Ireland, and Holland have from the first spoken none but an Aryan language.

(c) Only one argument is now left to the defenders of the non-Aryan theory. When the study of sociology first sprang up in the last century, it at once became a fundamental doctrine that the Aryans had always been strictly patriarchal, and that polyandry and descent through women was unknown amongst them. Though this view has received many rude shocks in later days, Professor Zimmer argues from it that the indigenous people of Britain and Ireland were non-Aryan.

It is well known from the ancient writers that the Picts were polyandrous and that succession was consequently through females. Again, it is certain, both from the ancient Irish literature and also from statements of external writers, that the Irish were polyandrous, and that they also almost certainly traced descent through women. Accordingly Professor Zimmer infers that the indigenous race was non-Aryan. But McLennan has long since pointed out that descent through women was the ancient law at Athens, and I have just shown that the Athenians and Arcadians, the autochthonous, dark-complexioned people of Greece, never spoke any save an Aryan tongue. Moreover, I have shown elsewhere that the Ligurians, who are now generally admitted to have spoken always an Aryan language, had descent through women, whilst I have also pointed out that there is good evidence that the ancient Latins, who have generally been taken as typical Aryans, had the same system. Again, it is admitted that the ancient Illyrians and dark-complexioned Thracians spoke an Aryan language, which, inasmuch as it differed materially in certain ways from that spoken by their Celtic overlords, must have been aboriginal, whilst I have further given grounds for believing that the ancient Iberians (though not the Basques) were also an Aryan-speaking folk. But there is good evidence that the Illyrians, melanochrous Thracians and Iberians all traced descent through women. In view of these facts it is useless to urge that because the Picts of Scotland and the ancient Irish had that system of succession through females these peoples must have been non-Aryan.

We have now reviewed the three main criteria of race at present used by anthropologists: (a) pigmentation of the skin, hair, and eyes; (b) the shape of the skull and other osteological characteristics; and finally (c) their system of tracing descent. We have seen that osteological differences may be but foundations of sand, because it is certain that such variations take place within very short periods, not only in the case of the lower animals, as in the horse family, but in man himself. Pigmentation is no true criterion, for we have found a steady tendency to change in colour in the case of the lower animals from latitude to latitude, whilst in the case of man the steady shading off in colour from dark to blonde may be traced from the equator to the Baltic. Unless then we postulate that man is entirely free from the natural laws which condition the osteology and pigmentation of other animals, we must admit that neither bone nor colour differences can be regarded as crucial criteria. Further, we saw that the test of descent through males or females broke down absolutely in the case of peoples who can be proved historically never to have spoken any but a non-Aryan language. Finally, we are forced to the conclusion that language, now that we realise what are the laws which govern its borrowing by one race from another, is really the surest of all the known tests of race when dealt with broadly and over wide areas, and not merely in the way of guesswork etymologies.

II. Hitherto I have dealt only with the need of a rigid application of

zoological laws in studying the evolution of the various races of man. In the time that is still left I propose to touch briefly on the vast importance of such natural laws when dealing with the native races of our great dependencies and colonies, and in our own social legislation. I venture to think that the gravest mistakes which at present are being made in our administration and legislation are due to the total disregard of the natural laws, which not only modify and differentiate one race from another, but also are constantly producing variations within our own community. As physical characteristics are in the main the result of environment, social institutions and religious ideas are no less the product of that environment. Several of our most distinguished Indian and Colonial administrators have pointed out that most of the mistakes made by British officials are due to their ignorance of the habits and customs of the natives. It has been in the past an axiom of British politicians that in the English Constitution and in English law there is a panacea for every political and social difficulty in any race under the sun. Only let us give, it is urged, this or that State a representative parliamentary system and trial by jury and all will go well. The fundamental error in this doctrine is the assumption that a political and legal system evolved during many centuries amongst a people of North-Western Europe, largely Teutonic, and that too living not on the mainland but on an island, can be applied cut and dried to a people evolved during countless generations in tropical or subtropical regions, with social institutions and religious ideas widely different from those of even South Europeans, and still more so from those of Northern Europe. We might just as well ask the Ethiopian to change his skin as to change radically his social and religious ideas. It has been shown by experience that Christianity can make but little headway amongst many peoples in Africa or Asia, where on the other hand Muhammadanism has made and is steadily making progress, acting distinctly for good, as in Africa, by putting down human sacrifice and replacing fetish worship by a lofty monotheism. This is probably due to the fact that Muhammadanism is a religion evolved amongst a Semitic people who live in latitudes bordering on the aboriginal races of Africa and Asia, and that it is far more akin in its social ideas to those of the Negro or Malay than are those of Christianity, more especially of that form of Christianity evolved during the last twelve centuries by the Teutonic peoples of Upper Europe, who are of all races furthest in physical characteristics, in religious ideals and social institutions, from the dark races of Africa and Asia. This great gulf is due not merely to shallow prejudice against other people's notions, it is as deep-seated as is the physical antipathy felt by the Teuton for the Negro, which is itself due to the very different climatic conditions under which both races have been evolved. The Teuton does not freely blend with the black, and even when he does intermarry he treats his own half-bred progeny with contempt, or at most with toleration. On the other hand, some South Europeans, for example the Portuguese, are said to have little objection to intermarrying with dark races and allowing the mixed progeny an equal social status, whilst the Arab through the ages has freely taken to wife the African, and has never hesitated to treat the hybrid offspring as equals. There is thus a wide breach between the physique and the social and religious ideas of the African and our own; but, as political and legal institutions are indissolubly bound up with social and religious, it follows inevitably that the political and legal institutions of a race cradled in Northern Europe are exceedingly ill adapted for the children of the equator. Accordingly in any wise administration of these regions it must be a primary object to study the native institutions, to modify and elevate them whenever it may be possible, but never to seek to eradicate and supplant them. Any attempt to do so will be but vain, for these institutions are as much part of the land as are its climate, its soil, its fauna, and its flora. '*Naturam expellas furca, tamen usque recurret.*' Let us hope for a successful issue for the effort now being made by the Royal Anthropological Institute to establish an Imperial Bureau of Anthropology whose function will be not only to carry out systematically the scientific study of man, but also to aid the administrator and the legislator, the merchant and the missionary.

III. I now pass to my last and most important topic—natural laws in relation to our own social legislation. We have seen that environment is a powerful factor in the differentiation of the various races of man, alike in physique, institutions, and religion. It is probable that the food-supply at hand in each region may be an important element in these variations, whilst the nature of the food and drink preferred there may itself be due in no small degree to climatic conditions. Each zone has its own peculiar products, and beyond doubt the natives of each region differ in their tastes for food and drink. The aboriginal of the tropics is distinctly a vegetarian, whilst the Eskimo within the arctic circle is practically wholly carnivorous. In each case the taste is almost certainly due to the necessities of their environment, for the man in the arctic regions could not survive without an abundance of animal fat. It is probable that the more northward man advanced the more carnivorous he became in order to support the rigours of the northern climate. The same holds equally true in the case of drink. Temperance reformers would enforce by legislation complete abstinence from all alcoholic liquors, and they point to the sobriety of the Spaniards, Italians, and other South Europeans, and urge, if these nations are so temperate, why should Britons and Irish continue to drink beer and spirits in such large quantities? This appeal depends unfortunately on the false assumption that the natives of these islands enjoy the same climate as the people of the sunny south. All across Northern Europe and Asia there is a universal love of strong drink, which is not the mere outcome of vicious desires, but of climatic law. In Shakespeare's time 'your Englishman was most potent in potting,' and this was no new outbreak of depravity, for the earliest reference in history to the natives of these islands tells us the same tale. When Pytheas of Marseilles travelled in these regions, about 350 B.C., he found the people making 'wine from barley,' and, though he does not explicitly say so, we need not doubt that it was meant for home consumption. In view of these facts we must regard this tendency as essentially climatic. This view derives additional support from the well-authenticated fact that one of the chief characteristics of the descendants of British settlers in Australia is their strong teetotalism. This cannot be set down to their having a higher moral standard than their ancestors, but rather, as in the case of Spaniards and Italians, to the circumstance that they live in a country much warmer and drier than the British Isles. We must therefore, no matter how reluctantly, come to the conclusion that no attempt to eradicate this tendency to alcohol in these latitudes can be successful, for the most that can be done by the philanthropist and the legislator is to modify and control it, but especially by moral means.

I have spoken of the principles at work in the differentiation of one race from another. It may be that the same principles or others closely allied may be at work within each community, for each community is but the whole world writ small. Within the United Kingdom itself there are not only different physical types, but very different ideas respecting marriage and divorce embodied in the laws regulating those fundamental institutions in England, Scotland, and Ireland. If such fundamental differences exist in that most important of social institutions, we may well expect that the natural laws which differentiate one race from another may be at work within every community in the United Kingdom.

Yet though the world has been ringing with the doctrine of natural selection and the survival of the fittest for nearly half a century, no statesman ever dreams of taking these great principles into consideration when devising any scheme of education or social reform. On the contrary, it is a fundamental assumption in all our educational and social reforms that all men are born with equal capacities; that there is no difference in this respect between the average child of the labourer, sprung from many generations of labourers, and one born of many generations of middle or upper-class progenitors; and it is held that all that is necessary to make the children of the working classes equal, if not superior, to the children of the bourgeois is the same food, the same clothing, and the same educational advantages. On that account we have devised the so-called educational ladder. Yet if we ask any social reformer why are there middle classes, the answer will probably be that they are better off. But why are they better off? We are told that

their fathers and mothers were better off, and that they thus got a better chance than the poor labourer. But why were the parents of these middle-class folks better off? Oh! they came of families that had been long well-to-do. But why were these families long well-to-do? At last we are brought to the conclusion of the northern farmer, that 'Work mun 'a gone to the gittin' whiniver munny was got,' and to his brutal correlative respecting the labourers that 'Them or thir feythers, tha sees, mun 'a beän a laäzy lot.'

Work no doubt has been a main factor in the evolution of the middle and upper classes, especially in later times, though undoubtedly other qualities, such as superior physique and superior courage, have been very important elements in the earlier stages. But at all times it is not improbable that the special quality which led to their rise was a superior self-restraint, that enabled them to resist the vices which are too often attendant on prosperity. This superior morale acts in turn upon the offspring by setting up a better standard of life in the home, which of itself gives children brought up in such an environment an advantage at the outset of life denied to the children of inferior parents. It needs no elaborate induction to prove that the middle classes are not the outcome of chance, but of a long process of natural selection and the survival of the fittest in the struggle for life, the two main factors in this evolution being, in the language of Aristotle, heredity and training. Each community is but a microcosm of the whole human race, which, as I have endeavoured to show, is bound by the same laws as the rest of the animal kingdom. One race becomes a master because of its superior physique, courage, brain power, and morale; another sinks in the struggle or lags behind owing to its inferiority in the very qualities which have given the mastery to its rival. What is true of master races in relation to inferior races is equally true of the individuals in each community. The middle and upper classes are in the main sprung from ancestors with better physique, courage, and morale, and who have generation after generation been brought up in a better moral atmosphere than the children of the masses. Their ranks are also continually being reinforced by the best of the working classes. But this is not due to any educational ladder provided in modern times, for the process has always been at work, though of course its action has been distinctly aided by modern legislation. Mediaeval history supplies many examples of those who, though sprung from the humblest parents, rose to high place in Church and State. This was not due to any legislative enactments, but rather to a principle well known in the whole field of Nature. Everyone knows that the superior varieties of flowers and vegetables are commonly the 'sports,' as they are termed, from inferior species. The skilful gardener watches carefully for good 'sports,' for they may become very valuable additions to his *répertoire* of useful plants. So, too, the legislator must watch carefully for good human 'sports,' not for those with criminal propensities. In the mediaeval world the Church provided a ladder by which the son of the peasant could rise to be the counsellor of kings and princes. In modern times the State provides an educational ladder by which the child of the humblest parents may rise, if it has the capacity, to the highest positions in the community. It is right—nay, essential—that such a ladder should be provided, but this ladder is not for the mass of children. The vast majority can never climb beyond its lowest rung owing to their heredity, and in a less degree to their home environment. The ladder is for the good 'sports,' who by its aid are thus continually reinforcing with fresh blood the ranks of the middle and upper classes.

It may be said that I underrate the number of the good 'sports.' Of course it is very difficult to get any exact statistics on so complex a subject; but according to information which I have obtained from one of our great industrial centres, where the educational ladder enables any child who passes the fourth standard in the primary schools before it is eleven to rise into the secondary schools, it is probable that no more than 5 or 6 per cent. of the children of the working classes have at the age of sixteen the same amount of brain power as the average children of the middle classes at the same age. But even all this 5 or 6 per cent. of 'sports' cannot be credited to parents of the working class.

alone, for it may be that a certain proportion of them must be ascribed to middle or upper class parents. Of course these rude statistics must be corrected by others collected on a large scale all over the country before we can form a final judgment; but I believe that the evidence already to hand makes it improbable that more than a very limited percentage of the children of the working classes have the same ability as the average child of the middle classes.

In ancient days the chief end of the legislator was to produce a stalwart brood of citizens capable of bearing arms in defence of their country and advancing her material prosperity. Still more ought this to be the aim of our legislators to-day, for under modern conditions great masses of population are huddled together in a manner hardly known to ancient cities. To accomplish this great end, the legislator must not merely look to improved housing of the poor and the development of the physique of city populations. He must, as far as possible, conform to the principles of the stockbreeder, whose object is to rear the finest horses, cattle, or sheep. Amongst wild animals Nature selects the fittest for continuing the race, and the wise breeder simply aids Nature by selecting still more carefully the best animals. The legislator, on his part, ought similarly to foster the increase of the best element in the State, and on the other hand discourage the multiplication of the worst. Yet in our community statesmen of both parties have adopted the very opposite policy. The children of the working classes are educated at the cost of the State, the offspring of the wastrels are given free meals, and already there are demands that they shall be clothed at the expense of the ratepayers, and that the parents shall even be paid for providing them with lodging. It is not impossible that before long these demands will be conceded by either party in the State. The heavy additional expense incurred in this policy falls upon the middle-class ratepayers and taxpayers, who have to feed, educate, and clothe their own children at their own expense. It may be said that they can get free education for their children by sending them to the State schools; but this is to level down instead of to level up; for if they do so, they will be lowering the general morale of their own class, the most priceless asset of the nation. The heavy burden of taxation entailed by this policy, falling as it does with special weight on the middle classes, renders it more difficult each year for the young men and the young women in that class to marry before thirty, for they naturally shrink from the expense of bringing up large or even moderate-sized families. We need not then wonder at the falling-off in the rate of increase of the middle classes. Our legislators are bad stockmasters, for they are selecting to continue the race the most unfit physically and morally, whilst they discourage more and more the increase of what we have proved to be the outcome of a long process of natural selection. The present policy therefore tends to reduce that which in all ages has been the mainstay of every State, the middle class. The yeomen of England, the free burghers of Germany and of Italy, formed the best element in the Middle Ages. So was it also with the great republics of the ancient world. Aristotle, in more than one passage, has pointed out that the middle class, that which stands between the 'excessively wealthy' and the 'very poor,' between the 'millionaire' and the 'wastrel,' are the mainstay of every State, and he shows that, where the middle class has been crushed out by the millionaire or the mob, ruin has inevitably overtaken the State. Indeed, it is clear that the chief defect in the Greek democracies was the smallness and weakness of the middle class, whilst it is notorious that Rome prospered only as long as the middle-class citizens flourished. Her downfall came when they were extinguished by the great capitalists, who made common cause with the masses against them. The latter had no patriotism, were incapable of bearing arms, and had no aspirations beyond free meals and popular entertainments at the expense of the State.

It is of great scientific interest to discover how the short-skulled peoples of Asia and Europe became differentiated from their long-skulled congeners; it is of great practical importance to apply to the administration of our great dependencies and colonies the lessons taught by anthropology; but it is infinitely more important to maintain a vigorous stock of citizens for the kingdom and the

empire. Questions of the origin of races are, after all, only academic; but the other two, more especially the last, are intimately bound up with the life of the nation. If the present policy of our legislators is adhered to, the moral and the physical standard of the British citizen will steadily deteriorate, for the population will gradually come to consist of the posterity of those who are themselves sprung from many generations of the most unfit. Should this unfortunately come to pass, it will be the result of human pride refusing to apply to the human race the laws which inexorably regulate all Nature.

The following Papers were read:—

1. *The History of Mummification in Egypt.*
By Professor G. ELLIOT SMITH, M.A., M.D., F.R.S.

In predynastic times in Egypt it was the custom to bury the bodies of the dead in the sand, roughly wrapped in skins, linen, or matting. As the result of the dryness of the soil, and the exclusion of the air by the close adaptation of the sand to the body, desiccation often occurred before any putrefactive changes set in, and the corpse thus became preserved in a permanent form.

This phenomenon must have been perfectly familiar to the prehistoric Egyptians themselves, for we have abundant evidence of the fact that plundering of graves was common even at this early period. Moreover, the people of later times must have learnt for themselves how excellently Nature preserved the corpses of their predecessors, when they came to make tombs for themselves in long-forgotten predynastic graveyards.

Thus the idea must have naturally presented itself to the Egyptian people, perhaps in early dynastic times, to attempt to secure by art the preservation of their dead, which was no longer attained naturally, once it became the custom to put the body into a coffin or a rock-cut chamber, because the air thus buried with the corpse favoured putrefaction. The Egyptians would be encouraged in these attempts, to which they no doubt were prompted by their religious beliefs no less than by the natural inclination of all mankind to preserve the remains of those dear to them, by the help which the properties of their soil and climate afforded them, as well as by their knowledge of the properties of the preservative salts, found ready at hand in such abundance in Egypt, and of the resins obtained from neighbouring lands, with the properties of which they had been familiar even in predynastic times. In this way the origin of the idea, the reason for attempting to put it into practice, and the means for doing so become intelligible to us, and render it more than ever improbable that the custom of embalming could have been imported into Egypt from some foreign land, where none of these reasons for the initiation of the practice holds good. We have no exact data to permit us to say exactly when embalming was first attempted in Egypt. Although the earliest bodies certainly known to have been embalmed are of the period of the tenth dynasty (found at Sakkara by Mr. Quibell), there is some slight evidence to suggest that some form of mummification was attempted in the times of the earliest pyramid-builders.

By the time of the Middle Empire the general technique of the operation had attained the stage which in its main features was the conventional procedure for the succeeding two thousand years. But it was in the time of the New Empire that the process of mummification reached its highest development. Then for the first time the embalmers learnt how to remove the brain and pack the cranium, and put into practice the elaborate and difficult measures for restoring to the dead body a greater semblance to the form it had had in life; so that the statue of the deceased, which had been an essential part of the furniture of the tomb in earlier times, when the body either underwent corruption or was imperfectly preserved, became superfluous, and was no longer put into the tomb.

Further stages in the evolution of the art of embalming were followed by a rapid decline.